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LESPEDEZA STRIATA AND *L. STIPULACEA*¹

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(Plates 1091 and 1092)

Lespedeza is primarily a genus of perennials (herbaceous or shrubby). The lespedezas occurring in North America, however, include two annual species, *Lespedeza striata* (Thunb.) Hook. and Arn. and *L. stipulacea* Maxim. Both are introduced from eastern Asia and are widely cultivated in this country; both have escaped extensively and in the South are a conspicuous element of roadside, pasture, and wasteland flora. Of these two, *L. striata* only is treated in such manuals as have come to my attention, with the exception of Deam's Flora of Indiana where the two species are differentiated only on the basis of a pubescence character. It seems desirable to call attention to the widespread naturalized occurrence of *L. stipulacea* in certain areas of the country and to point out distinguishing characteristics between it and its better known congener. A brief review of important items in the botanical history of these two plants is also presented.

The name *Hedysarum striatum* was originally applied by Thunberg in 1784.² The plant concerned was doubtfully placed in the genus *Desmodium* by DeCandolle,³ and was transferred to

¹ In the course of preparation of even a short item such as this I have become indebted to several individuals for aid in obtaining literature and for suggestions made. Sincere thanks are offered. Particular acknowledgment is due CHARLES L. GILLY, who, in addition to making numerous constructive comments, prepared the included drawings.

² Fl. Jap. 289. 1784.

³ Prodrum 2, 337. 1825.

Lespedeza by Hooker and Arnott.⁴ I have not seen Thunberg's material, which is presumably in Upsala, nor have I seen literature references indicating that anyone else has checked the current application of this name. The original description is somewhat ambiguous. It is, in general, referable to, if not specific for, *L. striata* as we understand it today. The leaflets, however, are described in part as follows: "Foliola oblonga, obtusa, subretusa, setula acuminata . . . glabra linea dorsali pilosa." Oblong leaflets are distinctly characteristic of *L. striata*. The subretuse tip and dorsal pilose line are, however, scarcely to be noted for this species; they are, on the contrary, markedly characteristic of *L. stipulacea* (See Plate 1092). It is possible that Thunberg's specimens consisted of a mixture. Further comment upon this problem cannot be made until type material is available.

Maximowicz's *L. stipulacea* was described in 1859.⁵ The description is quite lucid, clearly referring to the plant now known under that name. Maximowicz also enumerates certain distinctions between his plant and *L. striata*. In subsequent Asiatic and European literature, however, these two species are much confounded. In some treatments they are maintained separately and in others regarded as synonyms. Maximowicz, himself, threw his plant into synonymy under *L. striata* in 1873.⁶ *Kummerowia*, described by Schindler in 1912,⁷ consists of a segregate genus based upon these species. Schindler distinguishes this genus from *Lespedeza* on the basis of the annual habit, leaf phyllotaxy, and certain characteristics of the inflorescence and fruit. However, while recognizing a "micro-genus" he did not distinguish between the two species; *L. stipulacea* Maxim. is listed as a synonym under *Kummerowia striata* (Thunb.) Schindl.

Relative to the application of the names in North America, Asa Gray⁸ appears to be responsible for originally identifying the "Japanese Clover", introduced earlier in the 19th century, as *L. striata* (Thunb.) Hook. and Arn. Pieters and Van Eseltine⁹ report as *L. stipulacea* Maxim. the "Korean lespedeza" introduced by the U. S. Department of Agriculture. They also point

⁴ Bot. Beech. 262. 1841.

⁵ Prim. Fl. Amur. 85. 1859.

⁶ Act. Hort. Petrop. 2, 382. 1873.

⁷ Fedde, Rep. 10, 403. 1912.

⁸ Am. Nat. 1, 495. 1867.

⁹ U. S. D. A. Dept. Circ. 317. 1924.

out certain characters useful in differentiating this species from *L. striata*. Reference is frequently made to their paper by agronomists, but it has been largely ignored by taxonomists.

The present note treats these annual lespedezas as being two superficially similar but amply distinct entities in the genus *Lespedeza*. The confusion in the literature concerning the identity of these plants and the frequent relegation of *L. stipulacea* to synonymy probably should be attributed to non-critical observation; this viewpoint will be substantiated by data given in the latter portion of the present paper. Relative to the generic position of these plants, it is granted that they should doubtless be considered a distinct section of the genus, but Schindler's generic segregation cannot be accepted.

The time and place of the introduction of *Lespedeza striata* upon the North American continent are problematic. The earliest printed reference which I have seen pertains to a collection of this plant near Monticello, Georgia, made in 1846.¹⁰ Early records indicate that the plant was well distributed over the southeastern portion of this country by the time of the Civil War. Attention was soon drawn to its value for pasturage; hence its subsequent employment as a cultivated plant. The story of *L. stipulacea* is the converse of the above. It was brought to this country in 1919 specifically for trial as a cultivated plant and has subsequently become established as an escape from cultivation. The original introduction was by seeds sent from Korea to the U. S. Department of Agriculture in Washington.¹¹ It is, of course, possible that, like *L. striata*, the plant was previously present in the United States, but there appears to be no definite evidence to this effect.

The range of these two plants in this country today is essentially equivalent to the areas in which they find agricultural employment. *L. striata* is a bit the more southern of the two. It reaches central Missouri, southern Illinois, and Indiana as a northern limit and extends west into eastern Kansas and Oklahoma, south and east to the Gulf and Atlantic coasts. *L. stipulacea* is present from central Iowa eastward to Pennsylvania and south to central Alabama and Georgia. Its western limits

¹⁰ Porter T. C., Am. Nat. 2: 39. 1868.

¹¹ Pieters and Van Eseltine, l. c.

are approximately the same as for *L. striata*. However, the recent introduction of varieties of *L. stipulacea*, which will set seed in Canada, suggests that it may in time become naturalized in more of our north central and northeastern states.

These two plants, particularly *L. striata*, possess tendencies characteristic of polymorphic species, displaying considerable variation in habit, leaflet shape, and pubescence; considerable physiological divergence is likewise exhibited in the varied degrees of adaptation of different varieties or strains to agronomic application in different agricultural regions. To some extent this aspect of natural variability is, perhaps, spurious, being the result of intercrossing between escapes representing various strains which have been selected out of the original population by man. It is entirely possible that the plant populations are much more uniform in their native habitats. In this country, *L. striata* is represented by three principal cultivated forms or varieties (in addition to numerous other less widespread selections). These are known as Common lespedeza,¹² Kobe lespedeza, and Tennessee 76. Kobe lespedeza possesses a certain degree of morphological differentiation relative to the other two forms, being larger, coarser, and more pubescent. The calyx-lobes are sparsely grey-pubescent in contradistinction to the glabrous or merely ciliate calyces of the Common lespedeza, and the loment and seed are markedly larger. It is neither one of, nor derived from, the *L. striata* strain or strains originally introduced into this country but has been recently (1920) brought in from Kobe, Japan. As to the possible varietal significance of Kobe lespedeza, recognition of such would scarcely seem to be justified, at least on the basis of its morphological characters alone, these being concerned primarily with size and pubescence. If, however, in its native habitat Kobe lespedeza represents a more or less definitive plant population possessing certain geographical or ecological characterizations in contrast to the other forms of this species, nomenclatural consideration as a variety might be in order. This, however, would not seem justified on the basis of its role in this country and cannot be considered in this present paper in the

¹² This plant in the past has been widely known under the appellation of "Japanese Clover" and is so designated in many of our manuals. This name has, however, been replaced almost entirely in common usage and in agronomic nomenclature by the perhaps more appropriate "Common lespedeza."

absence of data concerning its Asiatic distribution and variability.¹³

Tennessee 76 is a strain selected from parent stock of *L. striata* in this country. The plants are characteristically more erect-growing and larger than those of Common lespedeza but appear to have no definitive morphological distinctions of taxonomic significance.

L. stipulacea is known in this country under the names of Korean lespedeza and Harbin lespedeza. Korean lespedeza is represented by several selections such as Improved Early Korean and Late Korean. These forms have been synthesized from stock derived from the original introduction; none of them appear to have any distinctions of taxonomic significance. Harbin lespedeza, however, represents a separate introduction of this plant from Harbin, Manchuria. This plant is adapted to much shorter periods of vegetative growth. It is a smaller, more sparse plant than typical Korean lespedeza and may possess other characters indicative of varietal distinctness.

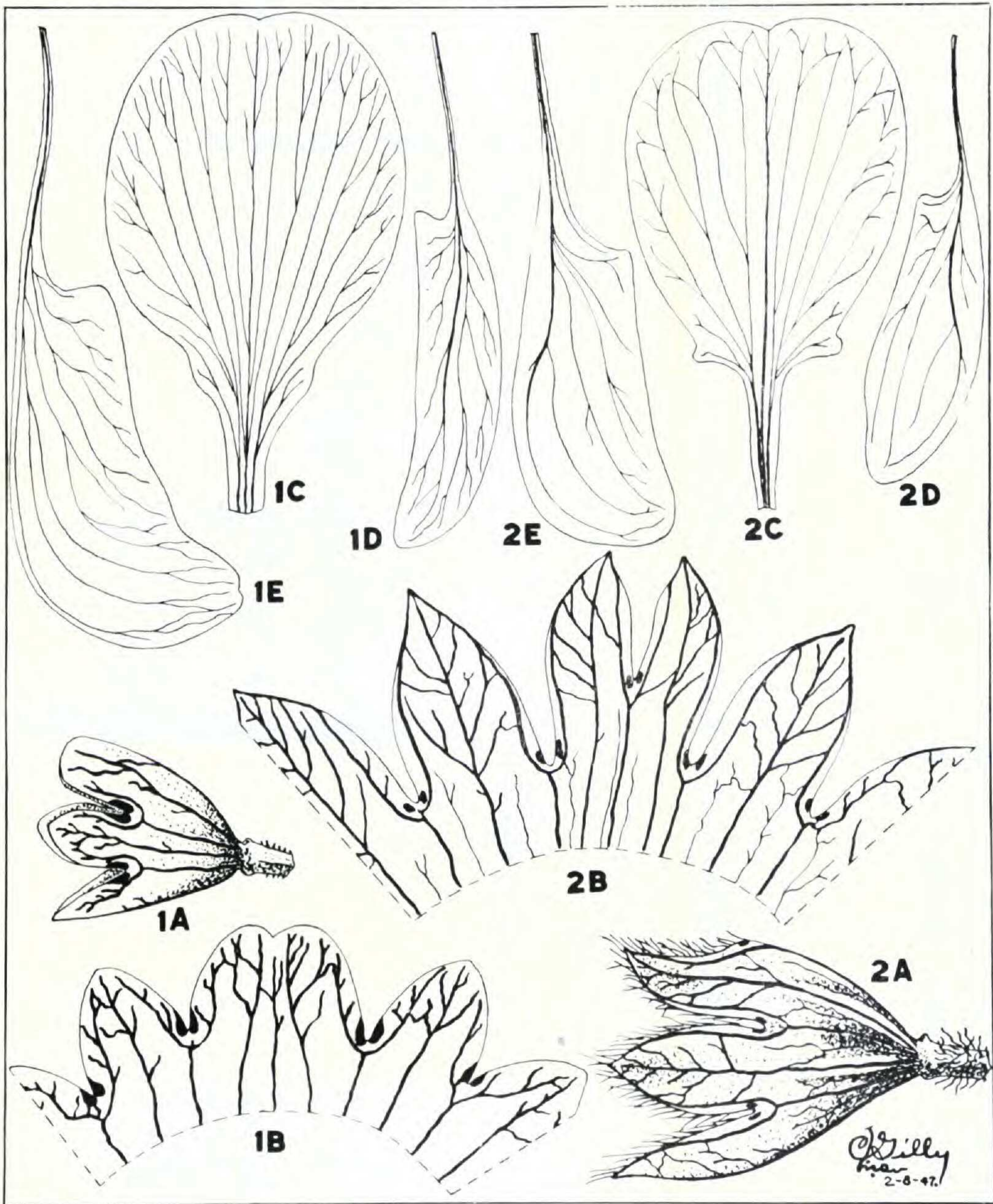
The most easily observed, but not invariably reliable, differences between the two species under discussion have to do with habit, petiole-length, and leaflet-shape, the most critical diagnostic distinctions are concerned with configuration of the calyx, loment, and seed. These and other helpful characterizations are presented in tabular form below. No attempt is made to give complete descriptions of these plants; only those characters wherein the species have been observed to differ are discussed.

¹³ Relative to the much-discussed problem concerning the advisability of giving recognition in the language of scientific nomenclature to various morphologically distinct, cultivated agronomic and ornamental plants, it might be commented that the element of time as well as that of structural discontinuity should be considered. I have heard it maintained that "varieties" and "strains" of many of our cultivated plants (particularly ornamentals) possess a much greater morphological divergence than do many "natural" varieties and subspecies. This is undoubtedly true—it is likewise true that many so-called varieties and subspecies should scarcely be recognized as such. Cultivated varieties, however, are apt to be ephemeral things; they are fancied for a few years and then dropped, as something better comes along, disappearing forever in oblivion. Being almost entirely dependent upon the hands of man for the maintenance of their genetic distinctness, they are in no way comparable as a definite biological entity to a self-perpetuating varietal or subspecific population with an established (albeit probably changing) ecological or geographical range. This generalization would seem to be applicable even if the morphological characters of the "natural unit" are rather weaker than those of the man-made "toy."

PLANT-CHARACTER	L. STRIATA (Thunb.) H. & A.	L. STIPULACEA Maxim.
HABIT ¹⁴	Prostrate or spreading, or, in close stands, ascending to erect, scarcely exceeding 20 cm. in height, diffusely branched.	Similar to <i>striata</i> but commonly taller and in dense stands, frequently scarcely branched.
STEM-PUBESCENCE	Downwardly appressed, in several lines, or covering nearly entire surface of stem.	Upwardly appressed or somewhat spreading, frequently only in one or two lines on stem angles.
LEAVES		
Petiole-length	1-2 mm., uncommonly 3-5 mm.; leaves usually appearing sessile.	4-10 mm. on main stems but frequently shorter on ultimate branchlets; leaves mostly appearing distinctly petioled.
Leaflet-shape	Obovate to narrowly elliptic or oblong, averaging about 2 times longer than wide, usually not apically emarginate.	Spatulate to obovate, averaging about 1.4 times longer than wide, usually strongly cuneate basally, and apically emarginate.
Leaflet-pubescence	Hairs absent or inconspicuously present on leaflet margin and midrib, short (considerably less than 1 mm. long), subappressed and relatively non-evident.	Hairs very conspicuous on margins and lower midrib of young leaflets, trichomes 1 mm. or more in length, divergent or subappressed, stiff.
STIPULES	3-5 (-6) mm. long, and 1-1.8 mm. wide	Variable in size, mostly 5-8 mm. long and 3-4 mm. wide on main stems, much smaller in inflorescences, sometimes particularly conspicuous at stem tips (previous to flowering) where they sometimes develop before the leaves and overlap in imbricate fashion.
INFLORESCENCE ¹⁵	Flowers arising from leaf axils of nearly entire plant, from main stems as well as branch apices.	Flowers arising from leaf axils of apical shoots; lower nodes frequently give rise to short flower-bearing shoots but not to axillary flowers.
FLOWER ¹⁵		
Calyx	(2-) 2.5-3.3 mm. long; teeth appearing 5 in number, subequal, the dorsal two somewhat united and thus ap-	1.5-1.9 mm. long, teeth appearing 4 in number; 3 (anterior and laterals) similar, narrow, pointed, the

¹⁴ P. L. Ricker (personal correspondence) comments on habit distinctions between these plants as follows: "While the stems of *striata* are often procumbent or decumbent, the tips of the branches almost always turn up and do not lie absolutely flat on the ground as do some stems of *stipulacea*."

¹⁵ Floral distinctions, other than those mentioned here, are abundantly present. These have to do with small but none the less definitive divergences in shape of the petals and the calyx-lobes, as well as the venation of these structures. It is believed that these are more clearly represented in Mr. Gilly's illustrations than would be possible by additional discussion.



Charles Gilly del.

LESPEDEZA STIPULACEA, FIG. 1.

L. STRIATA, FIG. 2.